

Containing the Atom

*Nuclear Regulation in a
Changing Environment,
1963–1971*

Re Scabing correspondence.

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studies of fetal sensitivity to radiation, was to lower permissible doses for pregnant women. The council reemphasized that radiation levels should be kept "as low as practicable." The director of the study, former Hanford manager Herbert M. Parker, told a press conference: "I think we all agree that the best exposure level is zero. It is idealistic, however, to expect zero release. . . . So the best realistic level is the lowest practicable level for each particular set of circumstances."⁵¹

While the debate over radiation standards attracted increasing attention, the AEC was reviewing public comments on changes it planned to make in its regulations. The revisions, announced in March 1970, proposed to add a requirement that licensees keep radioactive releases "as low as practicable." The regulatory staff received eighty responses to the publication of its draft, most of which supported tightening the regulations. A few environmental groups urged the AEC to reduce radioactive emissions to zero, but the most common complaint was that the meaning of "as low as practicable" was too vague. Twenty-five comments, including nineteen from nuclear utilities and vendors, advised the AEC to specify numerical limits as design objectives. The problems that the proposed wording could cause were itemized in the Westinghouse Corporation's statement: "Interpretation difficulties due to the present vague wording will lead to uncertainties for the systems designer; major disagreements between applicants and regulatory personnel, hearing boards and parties to hearings; increased intervention; lengthening of the licensing processes; and uncertainties in reporting requirements." The AEC had included quantitative design objectives in an earlier draft of its revisions, only to remove them at the insistence of the Joint Committee. After the public comments offered such a clear message, the regulatory staff again suggested that it develop "definitive criteria on design objectives." The Commission agreed; it made the proposed regulation effective 2 January 1971, with the provision that the regulatory staff would immediately take action to define "as low as practicable."⁵²

The staff promptly arranged meetings with industry representatives and environmentalists to explain the revised rules and to solicit advice in setting numerical exposure limits as design objectives. It also consulted with Joshua Lederberg, a Nobel prize-winning geneticist at Stanford University, who had published a number of newspaper articles on the radiation controversy. Lederberg suggested that for genetic reasons the AEC restrict exposure of individual members of the public to less than 10 millirem per year. Seaborg and other AEC officials responded

favorably to this proposal and sought ways to incorporate it into the new revisions.⁵³

On 30 March 1971 the regulatory staff sent a series of recommendations to the Commission. It suggested that a licensee would meet design criteria if effluents from its plant were less than 5 percent of natural background radiation. This was about 1 percent of the regulatory limit of a maximum exposure of 500 millirem by an individual member of the public, a level that remained in effect. Although the AEC's new numerical guidelines, if implemented, would not be inflexible requirements, the staff made clear that it would expect plants to comply with design objectives under normal operating conditions and would take enforcement action against those that did not. As an alternative to the 5 percent of background exposure, the regulatory staff proposed that a licensee would meet design objectives if it ensured that an individual living at the boundary of a plant did not receive more than 5 millirem per year. And to provide additional protection for population groups, the staff introduced a new concept (though one that was widely used in Europe) for measuring exposure, the "man-rem." It submitted that a plant would conform with design objectives if the exposure of the population within a fifty-mile radius did not exceed 100 man-rem per year for each 1000 megawatts of nuclear capacity. The man-rem, rather than assuming a uniform dose for an entire population group (as the existing standard did), estimated the exposure to those who lived within different concentric areas from a plant. It was computed by multiplying the average dose received by members of a large group by the number of people in that group. If members of a population group of 100,000, for example, were exposed to 5 millirem apiece, the total would be 500 man-rem. This method of measurement not only provided additional assurance that population exposure would remain very low but also undercut Gofman's and Tamplin's calculations, which were based on the assumption that every person in the United States received the allowable population exposure limit of 170 millirem.⁵⁴

Seaborg thought that the staff recommendations "would be a tremendous step" if the Commission accepted them. Ramey and Larson were hesitant, but the commissioners soon agreed on the proposals. The Joint Committee, on the other hand, was still strongly opposed. Holifield had an "extremely adverse emotional reaction" and threatened, as he had done a year earlier when the AEC informed him of its plan to set numerical guidelines, to withdraw his support from the agency. Other committee members also protested, though more mildly

53. AEC 213/107 (28 February 1966), AEC-R 38/11 (3 May 1966), AEC/NRC; "Summary Notes of Briefing on Safeguards and Domestic Material Accountability," AEC/DOE.